

## PATENT COOPERATION TREATY

RECEIVED

from the INTERNATIONAL SEARCHING AUTHORITY

JUN 18 2007

To:  
LARRY E. HENNEMAN, JR.  
HENNEMAN & SAUNDERS  
714 W. MICHIGAN AVE.  
THREE RIVERS, MI 49093

PCT

HENNEMAN &amp; ASSOCIATES PLC

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT AND  
THE WRITTEN OPINION OF THE INTERNATIONAL  
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year) <b>12 JUN 2007</b>	
Applicant's or agent's file reference 0025-013PCT	<b>FOR FURTHER ACTION</b> See paragraphs 1 and 4 below
International application No. PCT/US05/05139	International filing date (day/month/year) 18 February 2005 (18.02.2005)
Applicant FLEXTRONICS INTERNATIONAL USA, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70.

**For more detailed instructions,** see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Ngoc-Yen Vu  Telephone No. (571) 272-6950
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# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 0025-013PCT	<b>FOR FURTHER ACTION</b>		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US05/05139	International filing date ( <i>day/month/year</i> ) 18 February 2005 (18.02.2005)	(Earliest) Priority Date ( <i>day/month/year</i> ) 20 February 2004 (20.02.2004)	
Applicant FLEXTRONICS INTERNATIONAL USA, INC.			

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the Report**

a. With regard to the **language**, the international search was carried out on the basis of:



the international application in the language in which it was filed.



a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/05139

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: **H04N 5/225**( 2007.01)

USPC: 348/340,374

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 348/340, 374, 373, 335; 250/208.1; 257/678-734

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)


## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2002/0145676 A1 (KUNO et al.) 10 Oct. 2002 (10.10.2002), paragraphs [0060] to [0062].	1-28, 29-39 ----- 29
A, P	US 2004/0109079 A1 (FUJIMOTO et al.) 10 June 2004 (10.06.2004), paragraph [0026].	1-39
Y --- A	US 2003/0137595 (TAKACHI), 24 June 2003 (24.06.2003), paragraphs [0028] and [0029].	29 ----- 1-39

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 02 November 2006 (02.11.2006)	Date of mailing of the international search report 12 JUN 2007
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Ngoc-Yen Vu  Telephone No. (571) 272-6950

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
LARRY E. HENNEMAN, JR.  
HENNEMAN & SAUNDERS  
714 W. MICHIGAN AVE.  
THREE RIVERS, MI 49093

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 0025-013PCT		Date of mailing (day/month/year) <b>12 JUN 2007</b>
International application No. PCT/US05/05139		FOR FURTHER ACTION See paragraph 2 below
International filing date (day/month/year) 18 February 2005 (18.02.2005)	Priority date (day/month/year) 20 February 2004 (20.02.2004)	
International Patent Classification (IPC) or both national classification and IPC IPC: <b>H04N 5/225</b> (2007.01) USPC: 348/340,374		
Applicant FLEXTRONICS INTERNATIONAL USA, INC.		

1. This opinion contains indications relating to the following items:

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application   |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application  |

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion 09 November 2006 (09.11.2006)	Authorized officer Ngoc-Yen Vu Telephone No. (571) 272-6950
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Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US05/05139

**Box No. I Basis of this opinion**

I. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
- ☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
- ☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
- ☐ filed together with the international application in electronic form.
- ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>NONE</u>	YES
	Claims <u>1-28 and 30-39</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-39</u>	NO
Industrial applicability (IA)	Claims <u>1-39</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Please See Continuation Sheet

WRITTEN OPINION OF THE  
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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

**V. 2. Citations and Explanations:**

Claims 1-28 and 30-39 lack novelty under PCT Article 33(2) as being anticipated by US 2002/0145676 (Kuno et al.).

1. As to claim 1, Kuno et al. teaches a camera module apparatus, comprising: a camera integrated circuit chip 1 (see Fig. 1); a lens 3; and a molding 4 formed on the integrated circuit chip for holding the lens 3 such that the lens is positioned thereby in relation to the integrated circuit chip (see Fig. 1).

As to claim 2, see claim 1 and note that Kuno et al. further teaches the camera module apparatus of claim 1, wherein: the camera integrated circuit chip 1 is mounted on a printed circuit board 2 (see Fig. 1).

As to claim 3, see claim 1 and note that Kuno et al. further teaches the camera module apparatus of claim 1, further comprising: a protective cover 7 over the integrated circuit chip 1 (see Fig. 1).

As to claim 4, see claim 1 and note that Kuno et al. further teaches the camera module apparatus of claim 3, wherein: the protective cover 7 is a molded spacer (see Fig. 1 and note that 7 is a spacer between the molding 4 and the integrated circuit 1).

As to claim 5, see claim 3 and note that Kuno et al. further teaches the camera module apparatus of claim 3, wherein: the protective cover 7 is a glass sheet (see [0060]).

As to claim 6, see claim 1 and note that Kuno et al. further teaches the camera module apparatus of claim 1, wherein: the molding 4 has a recess for receiving the lens 3 (see Fig. 1 and note that the bottom of lens 3 intrudes into the opening in the molding 4).

As to claim 7, see claim 1 and note that Kuno et al. further teaches the camera module apparatus of claim 1, wherein: the lens 3 is held in place on the molding 4 by an adhesive (see [0065]).

As to claim 8, see claim 1 and note that Kuno et al. further teaches the camera module apparatus of claim 1, wherein: the molding 4 has a recess for positioning the lens 3 relative to the integrated circuit chip 1 (see Figs. 1 and 4 and note that recess between contact surfaces 4c in which the bottom of the lens is fitted into).

As to claim 9, Kuno et al. teaches an integrated camera circuit 1 and lens module 3, comprising: a camera integrated circuit 1; and

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INTERNATIONAL SEARCHING AUTHORITY**

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

a lens assembly 3; and wherein the lens assembly 3 is affixed (via 4) to the integrated circuit 1 (see Fig. 4).

As to claim 10, see claim 9 and note that Kuno et al. further teaches the integrated camera circuit and lens module of claim 9, wherein: the lens assembly 3 is rigidly affixed to the integrated circuit 1 such that there is a gap between at least a portion of the lens assembly and a sensor array of the integrated circuit (see Figs. 1 and 4).

As to claim 11, see claim 9 and note that Kuno et al. further teaches the integrated camera circuit and lens module of claim 9, wherein: the lens assembly 3 is attached to the integrated circuit 1 by a molded component 4 (see Figs. 1 and 4).

As to claim 12, see claim 11 and note that Kuno et al. further teaches the integrated camera circuit and lens module of claim 11, wherein: the lens assembly 3 is attached to the molding 4 by an adhesive ([0065]).

As to claim 13, see claim 9 and note that Kuno et al. further teaches the integrated camera circuit and lens module of claim 9, wherein: the integrated circuit 1 is mounted on a circuit board 2 (see Fig. 1).

As to claim 14, see claim 9 and note that Kuno et al. further teaches the integrated camera circuit and lens module of claim 9, further comprising: a protective cover 7 over the integrated circuit chip 1 (see Fig. 1).

As to claim 15, see claim 14 and note that Kuno et al. further teaches the integrated camera circuit and lens module of claim 14, wherein: the protective cover 7 is a molded spacer (see Fig. 1 and note that 7 is a spacer between the molding 4 and the integrated circuit 1).

As to claim 16, see claim 14 and note that Kuno et al. further teaches the integrated camera circuit and lens module of claim 14, wherein: the protective cover 7 is a glass sheet ([0060]).

As to claim 17, Kuno et al. teaches a method for producing a camera module, comprising: molding a receptacle 4 over an integrated circuit 1; inserting a lens assembly 3 into the receptacle 4; and securing the lens assembly into the receptacle ([0065]).

As to claim 18, see claim 17 and note that Kuno et al. further teaches the method of claim 17, wherein: the lens assembly 3 is secured to the receptacle 4 by an adhesive ([0065]).

As to claim 19, see claim 17 and note that Kuno et al. further teaches the method of claim 17, wherein: the integrated circuit 1 is secured to a circuit board 2 before the receptacle is molded over the integrated circuit 1 ([0070]).

As to claim 20, see claim 17 and note that Kuno et al. further teaches the method of claim 17, wherein: the receptacle 4 includes a recessed portion for receiving the lens assembly 3 (see Figs. 1 and 4).

As to claim 21, see claim 20 and note that Kuno et al. further teaches the method of claim 20, wherein: the recess portion includes a projection for fixing the distance of the lens assembly 3 from the integrated circuit 1 (see Figs. 1 and 4).

As to claim 22, see claim 17 and note that Kuno et al. further teaches the method of claim 17, wherein: the camera module is affixed to a flex circuit 2 ([0058]).

As to claim 23, see claim 17 and note that Kuno et al. further teaches the method of claim 17, further comprising: placing a protective cover 7 over the integrated circuit 1 (see Figs. 1 and 4).

As to claim 24, see claim 23 and note that Kuno et al. further teaches the method of claim 23, wherein: the step of placing the protective cover 7 over the integrated circuit 1 occurs during the step of molding a receptacle 4 over the integrated circuit 1 (see Figs. 1 and 4).

As to claim 25, see claim 23 and note that Kuno et al. further teaches the method of claim 23, wherein: the protective cover is a molded spacer (see Fig. 1 and note that 7 is a spacer between the molding 4 and the integrated circuit 1).

As to claim 26, see claim 23 and note that Kuno et al. further teaches the method of claim 23, wherein: the protective cover is a glass plate ([0060]).

As to claim 27, Kuno et al. teaches a camera apparatus, comprising: an integrated circuit camera apparatus having thereon a photosensitive array 1a; and a lens assembly 3 for focusing light on the photosensitive array 1a; wherein the lens assembly is rigidly affixed on the integrated circuit camera apparatus (see Figs. 1 and 4).

As to claim 28, see claim 27 and note that Kuno et al. further teaches the camera apparatus of claim 27, wherein: the lens assembly 3 has a housing 4 for receiving at least one lens (see Figs. 1 and 4).



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US05/05139

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

As to claim 30, see claim 27 and note that Kuno et al. further teaches the camera apparatus of claim 27, wherein: the integrated circuit camera apparatus is affixed to a circuit board 2 (see Figs. 1 and 4).

As to claim 31, see claim 27 and note that Kuno et al. further teaches the camera apparatus of claim 27, wherein: the integrated circuit camera apparatus is affixed to a circuit board 2; and a lens assembly receiving apparatus 4 is affixed to the circuit board 2 (see Fig. 1 and 4).

As to claim 32, see claim 31 and note that Kuno et al. further teaches the camera apparatus of claim 31, wherein: the lens assembly receiving apparatus 4 is a molded receptacle ([0075]).

As to claim 33, see claim 31 and note that Kuno et al. further teaches the camera apparatus of claim 31, wherein: the lens assembly 3 is rigidly affixed within the lens assembly receiving apparatus 4 (see Figs. 1 and 4).

As to claim 34, see claim 31 and note that Kuno et al. further teaches the camera apparatus of claim 31, wherein: the lens assembly 3 is affixed within the lens assembly receiving apparatus 4 by an adhesive ([0065]).

As to claim 35, see claim 27 and note that Kuno et al. further teaches the camera apparatus of claim 27, further comprising: a protective cover 7 fixed between the integrated circuit camera apparatus 1 and the lens assembly 3 (see Figs. 1 and 4).

As to claim 36, see claim 35 and note that Kuno et al. further teaches the camera apparatus of claim 35, wherein: the protective cover 7 is a molded spacer (see Fig. 1 and note that 7 is a spacer between the molding 4 and the integrated circuit 1).

As to claim 37, see claim 35 and note that Kuno et al. further teaches the camera apparatus of claim 35, wherein: the protective cover 7 is a glass plate ([0060]).

As to claim 38, see claim 35 and note that Kuno et al. further teaches the camera apparatus of claim 35, wherein: the protective cover 7 is held in place by an overmold 4 formed over the integrated circuit camera apparatus (see Figs. 1 and 4).

As to claim 39, Kuno et al. teaches a camera module apparatus, comprising: a camera integrated circuit chip 1; a lens 3; and means for holding the lens 4 such that the lens is positioned thereby in relation to the integrated circuit chip (see Figs. 1 and 4).

Claim 29 lacks an inventive step under PCT Article 33(3) as being obvious over US 2002/0145676 (Kuno et al.) in view of 2003/0137595 (Takachi).

As to claim 29, see claim 27 and note that what Kuno et al. doesn't teach is the lens assembly having a housing for receiving two lenses. However, Takachi teaches a lens assembly for an image sensor module that has a housing for receiving two lenses (see Fig. 2 and [0028]). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the housing of Kuno et al. in such a fashion so as to hold two lenses as is done in the invention of Takachi as compared to the case where a single lens is used, the use of the two lenses of Takachi can increase the number of apertures, prevent the distortion of a captured image and provide a clear captured image.

Claims 1-39 meet the criteria set out in PCT Article 33(4), and thus meet industrial applicability because the subject matter claimed can be made or used in industry.